NOVEMBER/DECEMBER 2024

GEPH42A/DEPH42A — CRYSTAL GROWTH AND THIN FILMS

Shanmuga Industries Arts & Science College T.V.Malai

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Write the Gibbs – Thomson equation.
2. Define – induction time.
3. Give the working of Verneuil technique.
4. Write the principle of MOCVD work.
5. Distinguish between point and space groups.
6. What are voids in crystals?
7. Why are some films called thin films?
8. How does vacuum technology help in making thin films?
9. Write a few lines about the Laue pattern.
10. Give the important applications of EDAX.

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) How does the saturation and supersaturation affect the crystal growth and nucleation?

Or

(b) Write a note on classical theory of nucleation.

12. (a) With a neat block diagram explain the working of Czochralski method.

Or

(b) How does a PVD system work? Give the features.

13. (a) Write briefly about the symmetry operation and symmetry element.

Or

(b) Explain in brief about the defects in the crystal.

14. (a) Write a short note on spin coating technique.

Or

(b) Distinguish between Reactive Sputtering and Radio-Frequency Sputtering.

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15. (a) With a neat diagram, explain the principle and working of SEM.

Or

(b) Explain what are TGA-DTA studies, explain their importance.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Explain the BCF theory in detail and examine its uses.

17. With a neat sketch explain in detail about gel growth technique.

18. Discuss important crystal structures with examples.

19. How does Pulsed laser deposition work? Explain it with a neat sketch.

20. With a neat sketch explain the working of power and single crystal XRD, and tell how it is used to characterize the nanomaterials.

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